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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,426	12/07/2001	Daniel M. Castagnozzi	applied_114	9539

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EXAMINER

TORRES, JOSEPH D

ART UNIT PAPER NUMBER

2133

DATE MAILED: 04/08/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

10/020,426

Applicant(s)

CASTAGNOZZI ET AL.

Examiner

Joseph D. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 March 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.  
4a) Of the above claim(s) 1-16 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 17-32 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 01 July 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-16, drawn to A Method for Comparing Various Bit Values in a Received Data Stream to Determine the Value of a Received Bit, classified in class 714, subclass 822.
  - II. Claims 17-32, drawn to A Multi-Threshold Decision Circuit for providing Bit Estimates Responsive to a Plurality of Voltage Threshold Levels, classified in class 714, subclass 709.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I, A Method for Comparing Various Bit Values in a Received Data Stream to Determine the Value of a Received Bit, and Group II, A Multi-Threshold Decision Circuit for providing Bit Estimates Responsive to a Plurality of Voltage Threshold Levels, are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention Group I, A Method for Comparing Various Bit Values in a Received Data Stream to Determine the Value of a Received Bit, has separate utility such as in a device not using the particulars of Group II. In the instant case, invention Group II, A Multi-Threshold Decision Circuit for providing Bit

Estimates Responsive to a Plurality of Voltage Threshold Levels, has separate utility such as in a device not using the particulars of Group I. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with Gerald Maliszewski on 24 March 2004 a provisional election was made without traverse to prosecute the invention of Group II, claims 17-32. Affirmation of this election must be made by applicant in replying to this

Office action. Claims 1-16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

**The Examiner recommends cancellation of claim 1-16 in response to the current Office Action in order to speed up prosecution and allowance of the application.**

### ***Oath/Declaration***

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

Applicant has not given a post office address anywhere in the application papers as required by 37 CFR 1.33(a), which was in effect at the time of filing of the oath or declaration. A statement over applicant's signature providing a complete post office address is required.

### ***Drawings***

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "116" and "308" have both been used to designate a flip-flop in Figure 7a. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "116" has been used to designate both a Past Decision Circuit in Figure 3 and a flip-flop in Figure 7a. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to because of illegible handwriting in the drawings. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 17-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "the non-causal bit value comparisons" in lines 11 and 12.

There is insufficient antecedent basis for this limitation in the claim.

The Examiner suggests the following changes to claim 17 in order to place the case in immediate conditions for allowance: --A non-casual channel equalization communication system, the system comprising: a multi-threshold decision circuit having an input to accept a non-return to zero (NRZ) data stream, an input to accept threshold values, and outputs to provide bit estimates based on non-causal bit value comparisons responsive to a plurality of voltage threshold levels; and, a non-causal circuit having inputs to accept bit estimates from the multi-threshold decision circuit, the non-causal circuit comparing a current bit estimate to bit value decisions made across a plurality of clock cycles, the non-causal circuit having an output to supply a bit value for the current bit estimate determined in response to the non-causal bit value comparisons.--

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 recites the limitation "the current, first bit, estimate" in line 5. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 18 in order to place the case in conditions for allowance: --a current first bit estimate--.

Claim 18 recites the limitation "the first bit estimate" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following

changes to claim 18 in order to place the case in conditions for allowance: --the current first bit estimate--.

Claim 18 recites the limitation "the first bit value" in lines 6-7. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 18 in order to place the case in conditions for allowance: --a first bit value--.

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 recites the limitation "the FEC corrections" in lines 9. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 22 in order to place the case in conditions for allowance: --FEC corrections --.

Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites the limitation "the first bit values" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 23 in order to place the case in conditions for allowance: --the first bit value--.



Claim 23 recites the limitation "the stream of corrected data bits" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 23 in order to place the case in conditions for allowance: --a stream of corrected data bits--.

Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 24 recites the limitation "the first bit values" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 24 in order to place the case in conditions for allowance: --the first bit value--.

Claim 24 recites the limitation "the stream of corrected data bits" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 24 in order to place the case in conditions for allowance: --a stream of corrected data bits--.

Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites the limitation "the first bit values" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following

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changes to claim 25 in order to place the case in conditions for allowance: --the first bit value--.

Claim 24 recites the limitation "the stream of corrected data bits" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. The Examiner suggests the following changes to claim 24 in order to place the case in conditions for allowance: --a stream of corrected data bits--.

**The Examiner asserts that claims 17-32 are replete with lack of antecedent problems. The Applicant should review MPEP § 2173.05(e) and revise all of claims 17-32 to remove all lack of antecedent problems in the claims. The Examiner has gone through several of the claims to give examples of lack of antecedent basis and solutions for removing the lack of antecedent basis problem.**

***Allowable Subject Matter***

5. Claim 17 would be allowed; if the examiners suggestion was accepted by the Applicant and claim 17 were amended as suggested by the Examiner.

The following is an examiner's statement of reasons for allowance:

The present invention pertains to a non-casual channel equalization communication system comprising a multi-threshold decision circuit having an input to accept a non-return to zero (NRZ) data stream, an input to accept threshold values, and outputs to

provide bit estimates based on non-causal bit value comparisons responsive to a plurality of voltage threshold levels.

Claim 17 recites various features:

“a non-causal circuit having inputs to accept bit estimates from the multi-threshold decision circuit, the non-causal circuit comparing a current bit estimate to bit value decisions made across a plurality of clock cycles, the non-causal circuit having an output to supply a bit value for the current bit estimate determined in response to the non-causal bit value comparisons”.

The Prior Art of record, and in particular Reed; David E. et al. (US 5771127 A, hereafter referred to as Reed), teaches a multi-threshold decision circuit having an input to accept a non-return to zero (NRZ) data stream (Figures 8F and 8G in Reed comprise a multi-threshold decision circuit having an input to accept the non-return to zero, NRZ, data stream of Figure 8C), an input to accept threshold values (Comparator B462 in Figure 8F is provided with an input to accept threshold values), and outputs to provide bit estimates responsive to a plurality of voltage threshold levels (Output 33 provides bit estimates responsive to a plurality of voltage threshold levels). The prior art however are not concerned with and do not teach, suggest, or otherwise render obvious a non-causal circuit (Note: Figure 3, claim 17 and lines 21-24 on page 6 of the Applicant's specification explicitly defines a non-causal circuit as accepting bit estimates based on non-causal bit value comparisons from the multi-threshold decision circuit; note also that lines 10-14 on page 3 of the Applicant's specification explicitly defines non causal bits as bit data effected by non-causal bit impairments such as spreading) having inputs

to accept bit estimates from the multi-threshold decision circuit, the non-causal circuit comparing a current bit estimate to bit value decisions made across a plurality of clock cycles, the non-causal circuit having an output to supply a bit value for the current bit estimate determined in response to the non-causal bit value comparisons (Note: lines 10-14 on page 3 of the Applicant's specification explicitly defines non causal bits as bit data effected by non-causal bit impairments such as spreading) as taught by claim 17. Hence the prior art taken alone or in any combination would fail to teach the claimed novel feature in claim 17.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee; Thean-Liang et al. (US 6014768 A) teaches signal processing in a read channel. Salaman; Roy G. et al. (US 3674922 A) teaches a transmission system for synchronized or unsynchronized non-return to zero (NRZ) binary waves. Giusto; Pietro P. (US 4538111 A) teaches a circuit for recovering the carrier of the received signal in the case of phase- and amplitude-modulated signals.

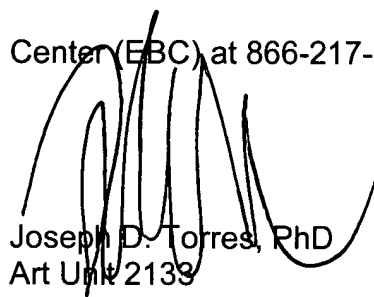
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Wang; Jiangzhou et al. (US 5459762 A) teaches a circuit for recovering the carrier of the received signal in the case of phase- and amplitude-modulated signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph D. Torres, PhD  
Art Unit 2133